in the PBSC product, we used a combination of CD34+ selection and ex vivo incubation with anti-CD3 antibody, which resulted in a mean 5.2-log reduction of T cells (range, 4.7–6.3 log). The final PBSC products contained a mean of 9.94 (range, 4.8–13.0) $\times 10^6$ CD34+ cells/kg and 1.34 (range, 0.06–4.54) $\times 10^3$ CD3+ cells/kg. The daily dose of CY was 200 mg/m^2 in the first 3 patients and 400 mg/m^2 in the next 2 patients. The mean half-life ($t_{1/2}$) of CD3+ cells in these patients was biphasic: 0.8 days from day −7 to day −5 and 0.2 days from day −5 to day −3, correlating with ATG administration. In contrast, the mean $t_{1/2}$ of CD3+ cells was 2.5 days in patients with hematologic malignancies receiving a myeloablative preparative regimen of CY, busulfan, and etoposide. After PBSCT, the median nadirs of WBC, ANC, and platelets were 1.2 (range, 0.4–2.0), 0.9 (range, 0.1–1.7) and 135 (range, 114–185) $\times 10^9$/L, respectively. All patients are alive at a median of 8.5+ months (range, 6.9+ to 17.5+ months) after PBSCT. Compared with pre-PBSCT levels, Rodnan total skin score (TSS) decreased by 4, 10, 11, and 15 points, respectively, in 4 patients and increased by 8 points in 1 patient, who also developed SSc renal crisis requiring hemodialysis at 12 months after PBSCT. Of 4 patients with improved TSS, 1 has worsening polymyositis and 1 has recurrence of palpable tendon friction rubs. Even at the lowest CY dose, this immunosuppressive regimen provides significantly greater and more rapid T-cell kill than a conventional myeloablative regimen. The efficacy of this regimen and TCD PBSCT in SSc is encouraging. but requires longer follow-up and experience with a larger number of patients.

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CONSOLIDATION AND MOBILIZATION OF PERIPHERAL BLOOD STEM CELLS USING HIGH-DOSE CYTARABINE AND ETOPOSIDE IN ACUTE MYELOID LEUKEMIA: A SINGLE INSTITUTIONAL EXPERIENCE

Shu, F., Bashey, A., Carrier, E., Castro, J., Holman, P., Lane, T., Medina, B., Corringham, S., Ball, E.D. Division of Blood and Marrow Transplantation, Department of Medicine, and Moores' UCSD Cancer Center, University of California at San Diego, La Jolla, CA.

Autologous hematopoietic stem cell transplantation (autoHSCT) as consolidation in first complete remission (CR1) is an option for patients with AML. Achieving adequate numbers of stem cells and eradicating residual leukemia cells with acceptable toxicity represent two conflicting goals. Between May 2000 and May 2004, we performed autoHSCT in 24 AML patients using a reduced dose modification of a cytarabine/etoposide regimen reported by Linker (BBMT 6:50–57, 2000) as a consolidation and stem cell mobilization regimen. Median age at the time of HSCT was 59 (range, 21–73; 50% > 60 years). Most patients had intermediate-risk (63%) or high-risk cytogenetics (25%). All patients but 1 were in CR1 before autoHSCT. After induction chemotherapy, 12 patients proceeded to consolidation/mobilization. Twleve patients had additional consolidation with cytarabine-based regimens (8 with 1 consolidation and 4 with 2 consolidations). All patients then received etoposide (5 mg/kg IV every 12 hours) and cytarabine (2 g/m^2 IV every 12 hours) for 3 days instead of the 4 days described by Linker. Patients received G-CSF (10 μg/kg SC) on day 14 until the WBC count was >10,000. The median number of CD34+ stem cells collected was 5.9 $\times 10^6$/kg (range, 1.3–75.5). Some 92% of patients received busulfan and cyclophosphamide as a conditioning regimen. There were no treatment-related deaths. Engraftment was rapid: WBC ≥ 1000 in 11.5 days (range, 9–19 days), ANC ≥ 500 in 12 days (range, 10–21 days), and platelets ≥ 50,000 in 17 days (range, 11–214 days). Median follow-up is 13.6 months (range, 2–52 months). Eleven patients (46%) relapsed at a median of 5.4 months (range 1.2–27.5 months). Median disease-free survival (DFS) for all patients is 27.5 months. Patients with intermediate- and high-risk cytogenetics had a 1-year DFS of 54% and 50%, respectively. Patients receiving at least 1 consolidation before the mobilization regimen had 1-year DFS and overall survival (OS) of 56% and 73%, respectively compared with 46% and 64% for those proceeding directly from induction to mobilization. Our data suggest that autoHSCT using reduced doses of cytarabine and etoposide as a consolidation and mobilization regimen is safe and effective at achieving engraftment, and is associated with encouraging outcomes in patients with intermediate- to high-risk cytogenetics. At least 1 consolidation before the mobilization/consolidation regimen may be associated with superior outcome. Prospective trials with larger numbers of patients are needed to validate our preliminary findings.

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AUTOLOGOUS STEM CELL TRANSPLANTATION (ASCT) FOR HIGH-RISK PEDIATRIC SOLID TUMORS

Fraser, C.J.[1], Weigel, B.J.[1], John, P.P.[2], Todd, D.E.[1], Kevin, B.S.[1], Michael, V.R.[1] [1]University of Minnesota, Minneapolis, MN; [2]Cincinnati Children's Hospital Medical Center, Cincinnati, OH.

Aim: The purpose of this study was to determine the toxicity of treatment with high-dose alkylating agents followed by ASCT, to monitor treatment response and to promote disease free survival in a group of pediatric patients with high risk solid tumors. **Methods:** A total of 36 patients with solid tumors having disseminated disease at diagnosis or following relapse were treated on 2 consecutive autologous transplantation protocols at the University of Minnesota between May 1995 and March 2004. Preliminary data on 11 of these patients have already been reported. The age range of the patients was 2–26 years. Of the 36 patients, 20 had a diagnosis of a Ewing's family tumor (16 Ewing's sarcoma and 4 desmoplastic small round cell tumor). Other diagnoses included rhabdomyosarcoma (in 3 patients), Wilm's tumor (in 2), medulloblastoma (in 2), and ependymoma, atypical teratoid rhabdoid tumor, glioblastoma multiforme, osteosarcoma, hepatoblastoma, retinoblastoma, cervical chordoma, ovarian small cell carcinoma and ovarian mixed anaplastic germ cell tumor each in 1 patient. Patients were eligible for transplantation if they had a complete response (CR) (18 patients) or a very good partial response with nonprogressive disease (18 patients). Conditioning therapy consisted of either oral busulfan (12 mg/kg) or intravenous busulfan (9.6 mg/kg > 4 years; 12 mg/kg < 4 years), melphalan (100 mg/m^2) and thiotepa (500 mg/m^2). Thirteen patients received the chemoprotectant amifostine. All patients received G-CSF until neutrophil engraftment. Twenty patients received PBSC, 15 patients received autologous bone marrow, and 1 patient received syngeneic marrow. **Results:** Median time to neutrophil engraftment, defined as the first of 3 consecutive days of an ANC > 0.5 $\times 10^9$/L, was 11 days (range, 9–56 days). Overall survival was 63% (range, 47%-79%) at 1 year and 33% (range, 16%-50%) at 3 years. Disease-free survival was 28% (range, 13%-43%) at 3 years. Median follow-up among survivors is 3.5 years (range, 0.6–7.9 years). Three-year overall survival for Ewing's family tumors was significantly better than for all other diagnoses (54% vs 13%; $P = .03$). Three-year overall survival was significantly better for those patients transplanted after CR (48% vs 12%; $P = .03$). There were 2 toxic deaths attributed to veno-occlusive disease. **Conclusions:** Our data indicate that ASCT after high-dose alkylating agent therapy has acceptable toxicity and should be considered as consolidation therapy for patients with high-risk Ewing's family tumors. The effectiveness of this therapy for other diagnoses appears to be limited.

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TANDEM AUTOGRAFTS FOR MULTIPLE MYELOMA PATIENTS USING TWO DIFFERENT CONDITIONING REGIMENS: AN INTERIM ANALYSIS

Liu, H.[1], Roberts, C.[2], Pumphrey, P.[2], Wingard, J.R.[1], Moreb, J.S.[1] [1]University of Florida College of Medicine, Gainesville, FL; [2]Shands Hospital at University of Florida, Gainesville, FL.

Autologous stem cell transplantation (ASCT) has become a standard therapy for multiple myeloma (MM) patients. In the current study, we evaluated the toxicity and efficacy of tandem autografts